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MAN.

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ERECT ATTITUDE. It might appear a sufficient proof of the upright attitude and biped progression being natural to our species, that such has been the invariable practice of all nations in all ages of the world;—that no people, no tribe, nor even any individual in a healthy condition, has been known to do otherwise. Yet even this has been contested; and, as philosophers have not been wanting to argue that we were naturally furnished with tails, but by some strange change or chance, had got rid of the degrading appendage, so others have held that we were designed by nature to go on all-fours,—justifying the acute remark of Cicero—'*Nihil tam absurdum quod non dictum sit ab aliquo philosophorum.*'*

The chief support of this notion concerning the human subject being naturally quadruped, has been derived from the examples of *wild men;* that is, children lost in woods and growing up in a solitary state. Even Linné has kindly taken them under his protection, and has provided a respectable situation for them in his *Systema Naturæ*, under the head of *homo sapiens ferus.*

What is this *homo ferus* of Linné? How are we to consider these wild men? In different countries of Europe a few individuals—and very few indeed are authentically recorded—have been met with in a solitary state;—young persons, wandering

* There is nothing so absurd as not to have been said at some time by some one of the philosophers.

alone in woods or mountainous regions. To unsophisticated common sense, they appear poor, half-witted, stupid beings, incapable of speech, with faculties very imperfectly developed, and therefore probably escaping from or abandoned by their parents or friends. But their case has been eagerly taken up and warmly defended by some philosophers, who employ them to exemplify *natural* man—the original uncorrupted creature—in opposition to those who have become vitiated and degenerate by civilization. When presented to us in so important a character, and with such high pretensions, it is necessary to inquire a little into the proofs of their pedigree and claims.

Peter the Wild Boy, who lived many years in England, is one of the most authentic cases; and his biography will answer the purpose very well. In July, 1724, Jurgen Meyer, a townsman of Hameln, met in his field with a naked, brownish, black-haired boy, apparently about twelve years old, who uttered no sound, was enticed, by showing him two apples, into the town, and placed, for safe custody, in an hospital, by order of the burgomaster Severin. Peter—thus he was christened by the children on his first appearance in the town, and he went by the same name to his death—behaved rather brutish at first; seeking to get out at doors and windows, resting now and then on his knees and elbows, and rolling himself from side to side till he fell asleep. He did not like bread; but he eagerly peeled green sticks, and chewed the bark for juice, as he also did vegetables, grass, and bean shells. He soon learned to conduct himself more properly, and was allowed to go about the town. When anything was offered him to eat, he first smelt it, and then put it in his mouth, or laid it aside, shaking his head. In the same way he would smell people's hands, and then strike his breast, if pleased, or otherwise shake his head. When he particularly liked anything, as beans, peas, mulberries, fruit and particularly onions and nuts, he indicated his satisfaction by striking repeatedly on his chest.

When shoes were first given to him, he could not walk in them, and appeared happy in getting rid of them and again running about barefooted. Covering the head was equally unpleasant to him; and he enjoyed greatly throwing his hat or cap into the Weser, and seeing it swim down. But he soon became accustomed to clothing. His hearing and smell were acute.

In October, 1725, he was sent for by George I. to Hanover; whence he was transmitted to London in the beginning of the

following year, under the care of one of the king's messengers, and this was the foundation of his fame and fortune.

Just at this time the controversy about the existence of innate ideas was at its height; and Peter seemed the very subject for determining the question. Count Zinzendorf wished that he should be intrusted to his charge, that he might watch the developement of his innate ideas; but the king had already placed him at the disposal of the Princess of Wales, the afterwards celebrated Queen Caroline, who confided the precious trust to Dr. Arbuthnot, still for the purpose of investigating his *innate ideas*.

Swift has immortalized him in his humorous production, '*It cannot rain, but it pours; or, London strewed with rarities.*' Linné gave him a niche in the *Systema Naturæ*, under the denomination of *Juvenis Hanoveranus*: Buffon, Paauw, and J. J. Rousseau, have extolled him as the true child of nature, the genuine unsophisticated man. Monboddo is still more enthusiastic, declaring his appearance to be a much more important occurrence than the discovery of the planet Uranus, or than if astronomers, to the catalogue of stars already known, had added thirty thousand new ones.

Amidst these expectations and honors, a few circumstances were either unknown or overlooked, calculated to raise great doubts of Peter's fitness for such high destinies, and to produce an unpleasant suspicion that he had not entirely escaped the contaminating influence of civilized life.

When he was first met with, a small fragment of a shirt hung about his neck; and the whiteness of his thighs, compared to his brown legs, proved that he must have worn breeches, but not stockings. His tongue was very large, and little capable of motion; so that an army surgeon at Hameln thought of attempting to set it free by cutting the frenum; but did not perform the operation. Further, some boatmen, in descending the Weser, had seen at different points on the banks of the river, a poor naked boy, and had given him something to eat; and, lastly, it was ascertained that a widower at Luchtringen had had a dumb child; who, having been lost in the woods in 1723, returned home again; but, on his father's second marriage was driven out again by his stepmother.

Dr. Arbuthnot soon found out that no brilliant discoveries in psychology or anthropology could be expected from the case of this poor idiot: he was therefore placed with a farmer in Hertfordshire, where he continued to live, or rather vegetate, till 1785.

Peter was of middle size, somewhat robust in appearance, and strong, and had a respectable beard. He took the ordinary mixed diet, retaining his early fondness for onions. He liked warmth; and relished a glass of brandy. He always showed the most perfect indifference to the other sex.

He could not be taught to speak; the plainest of the few articulate sounds he could utter were *Peter*, *ki sho* and *qui ca;* the two latter being attempts at pronouncing King George and Queen Caroline. He had a taste for music, and would hum over various airs that he often heard: when an instrumental performance took place, he would jump about with great delight till he was quite tired. He was deficient in one important privilege of our nature; having never been seen to laugh.

He was a harmless and obedient creature, and could be employed in little domestic offices, or in the fields, but not without superintendence. Having been left to himself to throw up a load of manure into a cart, as soon as he had executed the task, he jumped up and set to work as diligently to throw it all out again. Having, on one occasion, wandered away from home as far as Norfolk, at the time when great alarms existed about the pretender and his emissaries, he was brought before a justice of the peace as a suspicious character; and making no answer to any interrogatories, was deemed contumacious, and sent to prison. A fire broke out in the night; when he was found sitting quietly in a corner, enjoying the light and warmth very much, and not at all willing to move. Such was this famous representative of unsophisticated human nature.

Although Peter was little capable of filling that high station, his history affords a striking and useful caution, by exhibiting the uncertainty of human testimony and historical evidence. No two accounts agree in the year, season, and place of his discovery; and later printed histories contain serious narratives of George I. having found him in hunting at Herrenhausen, or in the Harz; that it was necessary to cut down the tree, in the top of which he had taken refuge; that his body was covered with hair, and that he ran on all-fours; that he jumped about trees like a squirrel, knew how to get bait out of traps placed for wolves; that he was carried over to England in an iron cage, learned to speak in nine months at the court of the queen, was baptized at the house of Dr. Arbuthnot, and soon after died, &c. &c.

Peter was as upright in his attitude, and as invariably biped, as any of ourselves; and the same remark holds good of

all the other authentic examples; as of the girl described by Condamine, a man found in the Pyrenese, and the boy met with near Aveyron, and brought to Paris soon after the revolution. On the other hand, where they have been described as going on all-fours, suspicious circumstances occur in the narration, caculated to throw discredit on the whole.

An unprejudiced examination of all these cases, putting aside what is obviously exaggerated or fabulous, proves that they are merely instances of defective organization; malformed individuals incapable of speech, and exhibiting few and imperfect mental phenomena; pathological specimens, therefore, rather than examples of human perfection. Nothing can be conceived more widely removed from the natural condition of man, than these half-witted beings; and we might as rationally adopt any *lusus naturæ* for a model of the human form, as set them up for a standard of the attitude, progression, or faculties of man.

But if these beings had been free from defect, if they had been well-formed, and capable of all human endowments, should we deem them more *natural* for having been solitary? should we not, on the contrary, be justified in regarding that insulated condition as a deviation from the scheme of nature, comparing it, with Voltaire, to the state of a bee which has lost the hive?* Is the social rook or antelope more artificial or degenerate than the solitary eagle or lion?

If the erect attitude and biped progression be peculiar to man, the structure of the lower limbs, which support his trunk, and of their muscles which move it, must exhibit characters of form, size and arrangement, which are met with in no other animals. The influence of this peculiarity will not be confined to the lower limbs: it will also modify the pelvis, which is the basis of the trunk; receiving above the weight of the abdominal viscera, the thorax, upper limbs and head, transmitting this weight to the lower limbs, and offering fixed points for their motions: the upper limbs, which are not employed for support, but merely as instruments of prehension; the thorax, by which these are separated, and on which they rest; and the junction of the head with the vertebral column, on which the due support of this weighty mass, and the proper direction of the eyes, mouth, and face depend.

The length and strength of the lower limbs, the great instruments of support and progression, are very striking, and quite

* 'If one should meet a wandering bee, would he infer that it is of a genuine nature, and that those which work together in societies in the hive are degenerate?'

peculiar to man. They are equal in length to the trunk and head together: which is not the case in any other animal, excepting the kangaroo, jerboa, &c. where the principles of construction and the offices of these parts are quite different from the human.

In all the monkey tribe, they fall very far short of this proportion: even in the orang outang they are short and weak, and manifestly inadequate to sustain the body erect. This circumstance alone effectually disqualifies the most manlike monkey from participating with man in that grand attribute; and would of itself be a sufficient ground for specific distinction between the two beings. If the lower limbs of monkeys are weak in comparison with the human, those of other animals, and particularly of true quadrupeds, are much more so: the short thigh bone is almost concealed by the muscles of the body; and the rest of the limb is slender, and not covered by any great muscular masses.

The disproportion in the respective lengths of our upper and lower limbs, clearly points out the different offices they are destined to execute. The superior length and power of the latter, so necessary for the various purposes connected with our erect attitude, make us altogether unfit for going on all-fours, as will be immediately shown by a trial. In such an experiment, either the lower limbs must be thrown obliquely backwards, or the articulations held in a bent and very insecure position. Even children before they can walk, in whom the lower limbs are comparatively shorter than in adults, crawl upon their knees, or else drag the lower extremities after them on the ground.

To the long and powerful femur, to the strong tibia, to the broad articular surfaces which join these at the knee, no parallel can be met with in any animal.

The breadth of the human pelvis affords an ample basis of support for the trunk; and this receives a still further transverse enlargement by the length of the cervix femoris, another peculiarity of human organization. This long neck throws the body of the bone outwards, disengages its shaft from the hip joint, and thus increases the extent of rotation: it gives the body greater firmness in standing, without impeding progression; since the head of the bone, and not the body, is the centre of motion. If the thigh bones possessed no necks, but were kept equally far apart by increasing the distance between the cotyloid cavities, the attitude of standing would be just as secure, the transverse base of support being still the same; but progression would be impeded, as it actually

is in the female, from the greater transverse diameter of the pelvis.

Another character of the human femur is the obliquity of its shaft, and superior length of the internal condyle, arising from the breadth of the pelvis, and length of the cervix, combined with the necessity for bringing its lower end perpendicularly under the pelvis, in reference to the secure support of the trunk.

The line of direction of the human femur is perpendicular, the same as that of the trunk; its axis coincides with the centre of gravity of the body: it is placed perpendicularly under the pelvis, and thus supports the trunk steadily. In all other animals it forms an angle with the spine; and this is often even an acute one. It is obvious that the erect attitude must be extremely unsteady, and the difficulty of maintaining the body in equilibrio very great in such an arrangement. When the vertebral column is raised perpendicularly in the orang outang, the thigh bones form an obtuse angle with it: the long arms preserve the balance, as they do likewise in the gibbon. The angle is increased in quadrupeds under similar circumstances; and the efforts they make to remain upright on the hind feet are continued with difficulty, more especially if not assisted by some other advantages of construction, as in the bear, for instance, by the length of the heel.

The feet, being the ultimate supports of the whole frame, and the primary agents of locomotion, are characterized by a combination of greater breadth, strength and solidity, in proportion to the size of the body, than those of any other animal. The whole surface of the tarsus, metatarsus, and toes, rests on the ground, and the os calcis forms a right angle with the leg. The two last circumstances are seen in no other animal: even the simiæ and the bear have the end of the os calcis raised, so that this bone begins to form an acute angle with the leg: the dog, the cat, and other digitated quadrupeds, even the elephant himself, do not rest on the tarsus or carpus, but merely on the toes: the cloven-hoofed ruminants touch the ground merely with the extremities of the third phalanges, and the os calcis is raised nearly into a perpendicular position. Thus as we depart from man, the foot is more and more contracted and elongated, the part serving for support reduced, and the angle of the heel bone rendered more acute.

THE DOG.

Grand Division—*Vertebralia*, possessing a vertebral column or spine. Class—*Mammalia*, nourishing the young by milk. Order—*Carnivori*, having cuspidate teeth, feeding more or less on animal substances. Genus—*Canis*, comprising dogs. Species—*Familiaris*, belonging to a family.

Neither majesty and elegance of form, strength of body, freedom of movement, nor other external qualities, constitute the principal dignity of animated beings. In man we prefer genius to figure, courage to strength, and sentiment to beauty; and therefore we are induced to think that the chief excellence of an animal consists also of internal qualities. By these, the dog differs from the automaton, rises above the vegetable tribes, and approaches the human species. It is sentiment which ennobles, governs and gives activity to all his organs and propensities. Hence the perfection of an animal depends on sentiment alone; and in proportion to its extent, his faculties, resources and relations with the rest of the universe are augmented. When his sentiment is delicate and improved by education, he is then fit to associate with man, to concur with his designs, to aid, to defend and to caress him. By a frequent performance of these services he conciliates the favor of his master, and from a tyrant converts him into a friend and protector.

The dog, independent of the beauty of his figure, his strength, vivacity and nimbleness, possesses every internal excellence which can attract the regard of man. A passionate, and even a ferocious and sanguinary temper, renders the wild dog formidable to all animals. But in the domestic dog these hostile dispositions vanish, and are succeeded by the softer sentiments of attachment, and the desire of pleasing. He runs with cheerfulness and alacrity to his master's feet, where he directs his courage, his strength and his talents. He awaits for orders which he is always solicitous to execute. He consults, he interrogates, he supplicates his master. A single glance of the eye is sufficient; for he knows the external signs of our intentions and wishes. Without being endowed, like man, with the faculty of thinking, his feelings are extremely delicate, and he has more fidelity and steadi-

ness in his affection. He is not corrupted by ambition, by interested views, or by a desire of revenge; and he has no fear but that of displeasing. He is all zeal, ardor and obedience. More apt to recall benefits than outrages, he is not discouraged by blows or bad treatment, but calmly suffers, and soon forgets them, or he remembers them only to increase his attachment. Instead of flying or discovering marks of resentment, he exposes himself to torture, and licks the hand from which he received the blow. To the cruelty of his master he only opposes complaint, patience and submission.

More tractable than man, and more pliant than any other animal, the dog is not only soon instructed, but even conforms himself to the manners, movements and habits of those who govern him. He assumes the very tone of the family in which he lives. Like other servants, he is haughty with the great, and rustic with the peasant. Always eager to obey and to please his master or his friends, he pays no attention to strangers, and furiously repels beggars, whom he distinguishes by their dress, their voice and their gestures. When the charge of a house or garden is committed to him during the night, his boldness increases, and he sometimes becomes perfectly ferocious. He watches, goes the rounds, smells strangers at a distance, and if they stop or attempt to leap any barrier, he instantly darts upon them, and, by barking and other marks of passion, alarms the family and neighborhood. Equally furious against thieves as against rapacious animals, he attacks and wounds them, and forces from them whatever they have been attempting to carry off; but, content with victory, he lies down upon the spoil, and will not touch it, even to satisfy his appetite—exhibiting at the same time an example of courage, temperance and fidelity.

To conceive the importance of this species in the order of nature, let us suppose that it never existed. Without the assistance of the dog, how could man have conquered, tamed and reduced the other animals into slavery? How could he still discover, hunt down and destroy noxious and savage beasts? For his own safety, and to render him master of the animated world, it was necessary to form a party among the animals themselves—to conciliate by caresses those which were capable of attachment and obedience, in order to oppose them to the other species. Hence the training of the dog seems to have been one of the first arts invented by man; and the result of this art was the conquest and peaceful possession of the earth.

Many animals are superior to man in agility, swiftness, strength and even courage. Nature has fortified and armed them better. Their senses, and particularly that of smelling, are likewise more acute. To have brought over to our interest a bold and tractable species, like that of the dog, was to acquire new senses and faculties. The machines and instruments we have invented to improve or to extend our other senses, are not to be compared, in point of utility, with those presented to us already made by nature, which, by supplying the defects of our smelling, have furnished us with great and permanent resources for conquest and dominion. The dog, ever faithful to man, will always maintain a portion of this empire; he will always preserve a degree of superiority above the other animals; he reigns at the head of a flock, and is better heard than the voice of the shepherd. Safety, order and discipline are the fruits of his vigilance and activity. Sheep and cattle are a people subjected to his management, which he prudently conducts and protects, and never employs force against them but for the preservation of peace and good order.

But in war against his enemies or wild animals, he makes a full display of his courage and intelligence. Here his natural and acquired talents are united. As soon as the din of arms is heard—as soon as the horn or the voice of the hunter gives the alarm, the dog, sparkling with redoubled ardor, demonstrates his joy by the most lively emotions. He announces, by his movements and cries, his impatience for the combat, and his passion for victory. Sometimes he moves silently along, reconnoitres the ground and endeavors to discover and surprise the enemy. At other times he traces the animal's steps, and by different accents indicates the distance, the species, and even the age of the fugitive. Pushed, intimidated and despairing of safety from flight alone, the deer likewise exerts his faculties, and opposes craftiness to sagacity. The resources of instinct are now worthy of admiration. To make the dog lose the scent, the creature doubles, returns on his former steps, bounds, and wishes to detach himself from the earth; at one leap he often clears a highway or a hedge, and swims over brooks or rivers. But, always pursued, and being unable to conceal or annihilate his body, he endeavors to start another animal of less experience, and after running together till the former imagines that the two scents or traces are confounded, he then suddenly separates, in order to let the other fall a victim to the deceived enemy.

But the dog, by the superiority he has acquired from habit and education, and from the peculiar fineness of his sensations, loses not the object of his pursuit. By the acuteness of his scent he unravels all the windings of the labyrinth, and the false routs which were intended to deceive him; and instead of abandoning the enemy for an indifferent animal, he redoubles his ardor, he overtakes, attacks, slays and extinguishes his thirst and his rage in the blood of the victim.

The propensity to hunting or to war is equally strong in man as in other animals. The principal knowledge of the savage is confined to fighting and hunting. All carnivorous animals, which have weapons and strength, hunt naturally. Wolves, foxes and wild dogs hunt in packs, assist each other with much art, and mutually share in the prey. When the natural talents of the dog have been improved by education—when he has learned to repress his ardor, and to regulate his movements, he then hunts artificially, and is always certain of success.

The dog is one of those animals which have been so long retained under the protection of mankind, that the real origin of the species remains in a state of uncertainty. Wild dogs appear to be found in large troops in Congo, Lower Ethiopia, and towards the cape of Good Hope. They are said to be red-haired, with slender bodies, and tails turned up like greyhounds. Others resembling hounds are of various colors, have erect ears, and are the size of a large fox hound; they destroy cattle, and hunt down the antelopes and other such animals, as our dogs do the stag. They run swiftly, have no fixed residence, and are very seldom killed, being so crafty as to shun all traps, and of so sagacious a nature as to avoid everything that has been touched by man. They go in large packs, and attack lions, tigers and elephants; and among the sheep of the Hottentots they commit terrific ravages. Their whelps are sometimes taken, but as they grow old become so ferocious that they cannot be domesticated. Modern naturalists are not inclined to allow that these wild dogs constitute the true and real species in a state of nature, but that they are the descendents of dogs once domesticated, and which have relapsed into a state resembling that of primitive wildness. Some consider the wolf as the parent source from whence our numerous race of dogs originally sprang. On this point it is remarked by Buffon that 'the wolf and the dog have never been regarded as the same species, except by the nomenclators of natural history, who, being acquainted with the surface of nature only, never extend their views be-

yond their own methods, which are always deceitful, and often erroneous, even in the most obvious fact.' It is more probable that the origin of the dog may be traced to the jackall than the wolf, but it must be also at the same time allowed that nothing can be relied upon with certainty on this subject.

The dog may be said to be the only animal whose fidelity is unshaken; who always knows his master and the friends of the family; who distinguishes a stranger as soon as he arrives; who understands the names and voices of the domestics; who confides not in himself; who calls for his lost master by cries and lamentations; who in long journies which he has travelled but once, remembers and finds out the roads. In fine, the dog is the only animal whose natural talents are conspicuous, and whose education is always successful.

Of all animals the dog also is the most perceptible of impressions, most easily modified by moral causes, and most subject to alterations occasioned by physical influence. His temperament, faculties and habits vary prodigiously; and even the figure of his body is by no means constant. In the same country, one dog differs greatly from another; and in different climates the very species seem to be changed. From these causes, the number and mixture of races are so great that it is almost impossible to recognize or enumerate them. To the same causes must be attributed those remarkable varieties in size, figure, length of muzzle, form of the head, length and direction of the ears and tail, color, quantity of hair, &c. In a word, nothing seems to be permanent in these animals but their internal organization and the faculty of procreating together. As those which differ most from each other are capable of intermixing, and of producing fertile individuals, it is evident that all dogs, however diversified, constitute but one species.

In this numerous variety of races it is difficult to investigate the character of the primitive stock from which they have all sprung. How shall the effects produced by the influence of climate, food, &c. be distinguished? How shall we perceive the changes introduced by the mixture of different races when in a wild or in a domestic state? In the progress of time, all the causes alter the most permanent forms, and the original stamp of nature never preserves its purity in beings which have been long under the management of man. This original impression is best preserved in those animals that have the independent choice both of their climate and food, the most ancient of which are still faithfully represented by their de-

scendants. But those which man has subdued, transported from climate to climate, and changed their food, their habits and manner of living, must necessarily have suffered the greatest alterations in their form; and it is a well known fact, that there are more varieties among the domestic than the wild animals; and, of all domestic animals, as the dog is the most closely attached to man, lives as irregularly, and is endowed with dispositions which render him docile, obedient, susceptible of every impression, and submissive to every restraint, it is not surprising that he should likewise exhibit the greatest variety in figure, size, color and other qualities.

According to Linné, his editors and translator, there are thirty-four distinct varieties of the dog. These, however, are variously intermixed, so that it is impossible ever to give a catalogue of all the intermediate shades of character among them. Their names and characters are as follows:—

1. *Shepherd dog.* Ears erect; tail woolly beneath.
2. *Wolf dog.* Hair of the head long; ears erect; tail much curved on the rump.
3. *Siberian dog.* Ears erect; hair all long.
4. *Iceland dog.* Ears erect with pendulous tips; hair long, except on the snout.
5. *Water dog.* Hair long, curled, appearing like a sheep.
6. *Dwarf water dog.* Hair long, curled; around the ears it is long, hanging down.
7. *King Charles dog.* Head smallish, rounded, snout short; tail curved back.
8. *Spaniel dog.* Ears long, woolly, pendulous; (See Fig. 2.)
9. *Maltese dog.* Hair soft, silky, very long.
10. *Lion dog.* Very small; hair on the belly and tail shorter.
11. *Danish dog.* Ears small, sub-pendulous; snout small, acute; legs slender.
12. *False pug-dog.* Ears small, sub-pendulous; nose thick, flattish.
13. *Pug-dog.* Nose crooking upwards; ears pendulous; body square.
14. *Bull dog.* Sides of the lips pendulous; body robust, and about the size of a wolf.
15. *Mastiff.* Very large; sides of the lips pendulous; body robust; (See Fig. 1.)
16. *German hound.* Ears pendulous; having spurious claws on the hind feet.
17. *Common hound.* Ears pendulous; having spurious claws on the hind feet, whitish, or white with spots.
18. *Blood hound.* Any hound that is very sagacious in pursuit.

19. ***Pointer.*** Tail truncate, spotted.
20. ***Barbet.*** Tail truncate, hair long, coarse; (See Fig. 5.)
21. ***Gaunt greyhound.*** Head long; snout robust; ears small, sub-pendulous; legs long, stout; body long, slender; (See Fig. 6.)
22. ***Irish greyhound.*** Body curved; snout narrowing; size of a mastiff; (See Fig. 4.)
23. ***Turkish greyhound.*** Body curved; snout tapering; hair a little curved; size of a mastiff.
24. ***Common greyhound.*** Body curved; snout tapering; size of a wolf; (See Fig. 3.)
25. ***Rough greyhound.*** Body curved; snout tapering; hair longer, curled; size of a wolf.
26. ***Italian greyhound.*** Body curved; snout tapering; small.
27. ***Naked dog.*** Body nearly destitute of hair; mostly small.
28. ***Oriental dog.*** Tall, slender; ears pendulous; hair on the tail hanging down very long.
29. ***Lurcher.*** Body narrow; legs stout; tail strong, straight; hair short, thick set.
30. ***Rough lurcher.*** Body narrow; legs stout; tail thick, straight; hair long, rough.
31. ***Bear lurcher.*** Head and snout thick; body narrow behind; feet long; hair long, rough.
32. ***Turnspit.*** Legs short; body long, often spotted. The feet are straight or curved; hair varies in length, and is straight or curled.
33. ***Alco dog.*** Head small; ears pendulous; back curved; tail short; size of a Maltese dog. It is sometimes very fat, neck short, belly large.
34. ***New Holland dog.*** Tail bushy, pendulous; ears short, erect; snout pointed.

Linné has asserted that the tail of the dog, in all its varieties, invariably bends to the left; but although such is often the case, it is by no means universal, as the slightest observation will demonstrate. Desmarest, however, has remarked a peculiarity as respects the tail of dogs, which appears much better entitled to rank as a specific character; that whenever this member is of white united with any other color, the white is always terminal. The same remark applies to other species of this genus equally with the dog.

We shall wave speaking at any considerable length on the many valuable qualities which so eminently characterize this valuable race of animals in a general point of view; these are too obvious to require demonstration, and have abundant claim to the generous impulse of our gratitude as well as

panegyric. The dog is our servant, but he is also our companion and our friend, and who, by his vigilance and attachment, more than amply repays the kindness we bestow upon him. But the good qualities of this animal, though uniformly felt, are not invariably acknowledged. In England, the dog is cherished and protected, but there are many parts of the world, not even to instance the more uncivilized states, where the condition of these ill-fated animals may justly excite our commiseration; countries in which the most solid and beneficial advantages are derived to society from their zeal and industry, and in reward for which they receive only the most inhuman and ungrateful treatment, detestation and contempt. It is, indeed, but too generally, in the cruel disposition of man, to recompense the most important services of the brute creation with the coldest insensibility and barbarity.

Notwithstanding the extraordinary natural faculties of the dog, it must be allowed that much depends on the education, and such is his docility as well as sagacity, that he rarely fails to improve to the utmost expectations of his tutor. There are numberless instances in which he must have exceeded every reasonable idea that could have been entertained of him. Instances of this kind must be familiar to every reader; but there are a few anecdotes on record of such an extraordinary nature, that we cannot refrain repeating them; they seem to evince a degree of dexterity and talent so much beyond the comprehension of the brute creation, that they cannot prove irrelevant. It is recorded of a dog, belonging to a nobleman of the Medici family, that he always attended at his master's table, changed the plates for him, and carried him his wine in a glass placed on a salver, without spilling a drop. This is surely a most astonishing instance of canine sagacity, but its attainments were perhaps outrivalled by the dog who was taught to speak. The dog alluded to, is mentioned by the French academicians; it lived in Germany, and could call, in an intelligible manner, for tea, coffee, chocolate, &c. The account is given by the celebrated Leibnitz, and was briefly this:—'The dog was of a middling size, and was the property of a peasant in Saxony. A little boy, the peasant's son, imagined that he perceived in the dog's voice an indistinct resemblance to certain words, and was therefore determined to teach him to speak distinctly. For this purpose he spared no time nor pains with his pupil, who was about three years old, when his learned education commenced; and at length he made such a progress in language as to be able to articulate no less than thirty words. It appears, however, that he was

somewhat a truant, and did not very willingly exert his talents, being rather pressed into the service of literature, and it was necessary that the words should be first pronounced to him each time before he spoke.' The French academicians add, that unless they had received the testimony of so great a man as Leibnitz, they should scarcely have dared to report the circumstance. This wonderful dog was born near Zeitz, in Misnia, Saxony.

Dogs in many countries are subjected to the severest labor. In Lapland and Siberia the dogs are compelled to convey travellers over the ice and snows of those inhospitable regions, in return for a solitary daily meal of the filthy offals of fish, scarcely sufficient to support life, and which they receive only when the labor of the day is over. Nor is their fate less severe in Holland, Newfoundland and other countries where the dogs are compelled as animals of draught for every similar purpose.

The dog is not a long-lived animal; twelve or fourteen years being its usual age, but some arrive at twenty. All the marks of age are long before conspicuous; the hair alters, the eyes grow dim, the hind legs become paralytic; weakness and extenuation terminate in death.

The dog, in common with other animals, is subject to multifarious diseases, the most dreadful of which is hydrophobia. From the recent excitement of this disorder we proceed to give a short treatise on the subject.

Hydrophobia.

Hydrophobia is a specific disease arising from the bite of a rabid animal. The animals most liable to be afflicted with madness are dogs; but cats, wolves, foxes, &c. are also subject to it.

The symptoms of rabies in the dog are the following, and are given nearly in the order in which they appear:—An earnest licking, or scratching, or rubbing of some particular parts; sullenness, and a disposition to hide from observation: considerable costiveness and occasional vomiting; and eager search for indigestible substances—as bits of thread, hair, straw and excrement; an occasional inclination to eat its own excrement, and a general propensity to lap its own urine. The last two are perfectly characteristic. The dog becomes irritable; quarrels with his companions; eagerly hunts and worries the cat; mumbles the hand or foot of his master, or perhaps suddenly bites it, and then crouches and asks pardon.

As the disease proceeds, the eyes become red; they have a peculiar bright and fierce expression; some degree of *strabismus* or squinting, very early appears—not the protrusion of the *membrana nictitans* or haw over the eye, which, in distemper, often gives the appearance of squinting, but an actual distortion of the eyes; the lid of one eye is evidently more contracted than that of the other; twitchings occur round that eye; they gradually spread over that cheek, and finally over the whole face. In the latter stage of this disease that eye frequently assumes a dull green color, and at length becomes a mass of ulceration. After the second day the dog usually begins to lose a perfect control of the voluntary muscles. He catches at his food with an eager snap, as if uncertain whether he could seize it; and he often fails in the attempt. He either bolts his meat almost unchewed, or, in the attempt to chew it, suffers it to drop from his mouth. This want of power over the muscles of the jaw, tongue and throat increases, until the lower jaw becomes dependent, the tongue protrudes from the mouth, and is of a dark and almost black color. The animal is able, however, by a sudden convulsive effort, to close his jaws, and to inflict a severe bite. The dog is in continual action; he scrapes his bed together, disposes it under him in various forms, shifts his posture every instant, starts up, and eagerly gazes at some real or imaginary object; a peculiar kind of delirium comes on; he traces the fancied path of some imaginary object floating around him; he fixes his gaze intently on some spot on the wall or partition, and suddenly plunges and snaps at it; his eyes then close, and his head droops, but the next moment he starts again to renewed activity: he is in an instant recalled from this delirium by the voice of his master, and listens attentively to his commands; but as soon as his master ceases to address him, he relapses into his former mental wandering. His thirst is excessive,* and, the power over the muscles concerned in deglutition being impaired, he plunges his face into the water up to the very eyes, and assiduously, but ineffectually, attempts to lap. His desire to do mischief depends much on his previous disposition and habits. It sometimes is known to proceed not beyond an occasional snap, and then only when the animal is purposely irritated; but with the fighting dog, the scene is often terrific. He springs to the end of his chain; he darts with ferocity at some object which he con-

*The word hydrophobia is derived from Greek *hudor*, water, and *phobos*, fear; on account of the aversion a rabid person has to water. This dread of water is not peculiar to the dog.

ceives within his reach; he diligently tears to pieces every thing about him; the carpet or rug is shaken with savage violence; the door or partition is gnawed asunder; and so eager is he in this work of demolition, and so regardless of bodily pain, that he not unfrequently breaks one or all his tushes. If he effects his escape, he wanders about, sometimes merely attacking those dogs which fall in his way; and at other times he diligently and perseveringly hunts out his prey: he overcomes every obstacle to effect his purpose; and, unless he has been stopped in his march of death, he returns in about twenty-four hours, completely exhausted, to the habitation of his master. He frequently utters a short and peculiar howl, which, if once heard, can rarely be forgotten; or if he barks, it is with a short, hoarse, inward sound, altogether dissimilar from his usual tone. In the latter stages of the disease, a viscid saliva flows from his mouth, with which the surface of the water that may be placed before him, is covered in a few minutes; and his breathing is attended with a harsh, grating sound, as if impeded by the accumulation of phlegm in the respiratory passages. The loss of power over the voluntary muscles extends, after the third day, throughout his whole frame, and is particularly evident in the loins: he staggers in his gait; there is an uncertainty in all his motions; and he frequently falls, not only when he attempts to walk, but when he stands balancing himself as well as he can. On the fourth or fifth day of the disease, he dies; sometimes in convulsions, but more frequently without a struggle. After death, there will invariably be found more or less inflammation of the mucus coat of the stomach; sometimes confined to the rugæ, at other times in patches, generally with spots of extravasated blood, and occasionally intense, and occupying the whole of that viscus. The stomach will likewise contain some portion of indigestible matter, and, occasionally, it will be completely filled and distended by an incongruous mass. The lungs will usually present appearances of inflammation, more intense in one, and generally in the left one, than in the other. Some particular points and patches will be of a deep color, while the neighboring portions are unaffected. The sublingual and partoid glands will be invariably enlarged, and there will also be a certain portion of inflammation, sometimes intense, and at other times assuming only a faint blush, on the edge of the epiglottis, or on the rima glottidis, or in the angle of the larynx at the back of it. The hydrophobia seems to be spontaneous, and capable of being communicated only by certain animals —the dog, the wolf, the fox and the cat. All animals which

have become rabid and bite, do not appear to be able to transmit it to others; as the hog, cow, sheep. In regard to man, it is not certain, whether the disease is communicable from the human subject. The hydrophobia is not commonly manifested in the time of greatest cold or greatest heat, but usually in March and April in wolves, and in May and September in dogs. It is rare in very warm or very cold climates. No particular cause of the rabies is known; it is a mistake to attribute it to a total deprivation of food, as a great number of experiments prove that this is not the effect of such treatment; or that dogs in cities are more subject to it than those in the country on being deprived of dog-grass or other vegetables on which they sometimes feed, for wolves and foxes, whose abodes are exclusively in the country, and who have every facility to obtain vegetables of that sort if required, are more subject to this disorder than dogs. All observation seems to prove the existence of a rabid virus, which is more violent when it proceeds from wolves than from dogs; as, out of a given number of persons bitten by a rabid wolf, a greater number will die than out of the same number bitten by a dog. The communication of the virulent hydrophobia by inoculation cannot be denied, and is the best proof of the existence of the virus. The virus appears to be contained solely in the saliva, and does not produce any effect on the healthy skin. But if the skin be deprived of the epidermis, or if the virus be applied to a wound, the inoculation will take effect. The developement of the rabid symptoms is rarely immediate; Dr. Hamilton, after a laborious research, fixes the tenth day after the infliction of the wound, as the earliest period at which this disease has appeared, and nineteen months as the latest. Between these periods the times of attack are very various. Of one hundred and thirty-one cases, seventeen were seized before the thirtieth day; sixty-three between the thirtieth and fifty-ninth; twenty-three from sixty to ninety days; nine from ninety to one hundred and twenty; and fourteen from five to nineteen months. The doctor afterwards relates the case of a boy bitten in the toe by a cat, in which the poison lay dormant three years and four months. The rabies, in the human subject, commences with a slight pain in the scar or bite, sometimes attended with a chill; the pain extends and reaches the base of the breast, if the bite be on the lower limbs, or the throat, if on the upper extremities. The patient becomes silent; frightful dreams disturb his sleep; the eyes become brilliant; pains in the throat and neck ensue. These symptoms precede the rabid symptoms two or three days. They are followed by a general shuddering at the approach

of any liquid or smooth body, attended with a sensation of oppression, deep sighs and convulsive starts, in which the muscular strength is much increased. After the rabid fit, the patient is able to drink. The disposition to bite does not appear to belong to any animals except those whose teeth are weapons of offence; thus rabid sheep butt furiously. A foamy viscid slaver is discharged from the mouth; the deglutition of solid matters is difficult; the respiration hard; the skin warm, burning, and afterwards covered with sweat; the pulse strong; the fit is often followed by a syncope; the fits return at first every few hours, then at shorter intervals, and death takes place generally on the second or third day. A great number of applications have been recommended, but without complete effect. The treatment of the disease is of two sorts; the one consists in preventing its developement; the other in checking its progress. The former consists in cauterizing the wound with iron heated to a white heat, the pain of the cautery being less, as the temperature is greater. The cautery is preferable to the use of lotions, liniments, &c., but it should be employed within twelve hours after the bite. It has been said that, in patients who were about to become rabid, several little pustules filled with a serous matter appear under the tongue, the opening of which would prevent the disease; but this is not well established. Various remedies have been prescribed for the cure of the declared hydrophobia. Bleeding, even to syncope, appears to have produced the greatest effect, but without complete success. Preparations of opium administered internally or by injection, mercurial frictions, belladonna, emetics, sudorifics, purgatives, &c. have been tried ineffectually. Yet the physician should not despair, as a remedy which has failed in one case may succeed in another. Above all, the patient should be treated gently, and his sufferings alleviated by consulting his comfort as much as possible; and the attendants should not forget that there is no instance of the rabies having been communicated from one man to another.

The following description of a case of hydrophobia is attested by two respectable physicians who attended the patient, which will be perused with melancholy interest:—

'On the 22d of March last, Lucas Drumwright, of Virginia, aged twenty-four years, was attacked by the paralizing symptoms of hydrophobia. He was bitten on the 29th of December, 1830, by a dog of his father's: the two wounds inflicted by the dog were situated between the two flexor muscles of the hand; the one about two inches from the articulation of the hand and fore-arm, and the other, two or three inches above

it. The last mentioned wound was deep; having been made by the fang of a bull dog.

'Both of the wounds were cauterized; onion and salt in the form of a cataplasm, were applied for some days; and the wounds healed in about three weeks. Nothing serious was apprehended until the evening of the 23d, when he became severely afflicted; complaining principally of numbness in his head, and a dull heavy feeling all over, he desisted from labor, retired, and hoped to find relief from rest, which he sought in vain, the night being spent by him with much restlessness, great anxiety, and deep sighing. On the morning of the 24th he felt great thirst, had a high fever, complained of an aching, stiffness and numbness in the neck and body; yet he could eat and drink whatever he chose without difficulty. He would occasionally doze, but start up as if alarmed or frightened; roll from one side of the bed to the other; and complain of a soreness in his breast and shoulders, with a difficulty of breathing. Medical aid having been called in, the physicians arrived about eight o'clock, A. M. A large dose of submurias of mercury with scammony was given, which operated well; the discharges were billious, not very offensive, but watery; his pulse, from the first of his complaining, became irregular, and his skin hot and dry. After the operation of the cathartic, great heat, thirst, numbness and restlessness, with a pain in his neck and head ensued. His right temporal artery was then opened, which afforded some temporary relief. He slept for nearly two hours; when he awoke, the other temporal artery at his request was opened, which produced little or no alteration for the better; difficulty of breathing upon the presentation of liquids, diet or polished metals, continued to increase. About twelve o'clock he was without fever; but there was a jerk and quickness about the pulse, which very much resembled a mercurial or hectic pulse; two grs. opii. and ten grs. calomel were given. About one o'clock, P. M. there appeared to be a considerable determination to the larger vessels; his heart beat strong, pulse irregular, had cold, clammy sweats, with great anxiety. He asked for some custard, which, when shown him, produced unpleasant sensations; but by much persuasion he swallowed a tea-spoonful with great difficulty. Every ten or fifteen minutes violent agitations or fits almost suffocated him to death; the violence of which was increased if he saw water, heard it poured or spoken of; to avoid the sight and hearing of which, he would thrust his head under the sides of the bed, and request that it be removed from his sight and hearing. His breath became very fetid, his tongue very much

swollen and of a bluish color; though not much fur on it, only about the root, which was of a dark green. About two o'clock P. M. the wounds were cut open and pieces trimmed out; a seton put in the back of his neck; both of which operations he sustained without complaint. There being considerable torpidity about his bowels, an injection was given, and about eight o'clock, P. M. he had two evacuations in the space of twenty minutes, which reduced his pulse from sixty to forty-five beats in a minute; the other symptoms continued without alteration; gave him two grs. of opii. which rendered him more quiet. About four o'clock, A. M. 25th, he complained much of thirst, but could not bear the sight of water; however, the water vessel was covered, and, with great difficulty he sucked two or three swallows which almost deprived him of breath. Calomel and morphine continued every four hours, mercurial ointment, camphor and Cayenne pepper, rubbed over the region of the stomach, liver, lungs, bowels, arms, thighs and spine every three hours. The pulse, which at eight o'clock had fallen to 37 beats a minute, had now (about twelve o'clock) risen to 88 beats; though rather weak and quick; and at two o'clock up to 100: cold clammy sweats, with numbness in his extremities; he manifested great anxiety and distress, especially at the sudden sight of a friend or relative. The paroxysms became more regular; the least cold air (even to throw off or on the bed cover suddenly) would produce a fit. At three o'clock, P. M. his pulse rose to 130 beats a minute, and was a little hard and irregular; his skin hot and dry; his fits more frequent and severe: with considerable restlessness, yawning and stretching. His eyes had now become quite red, his voice hoarse, his tongue much swollen, of a reddish or leaden color, and his mouth filled with a thick, ropy slime. Medicine continued, but no salivation produced: a strong injection of active medicines given without effect. At about seven o'clock a copious passage of urine which was highly colored; he swallowed his medicine in the form of a bolus; the sight of diet or drink was very offensive to him, and the power of deglutition nearly failed. About nine o'clock he became somewhat desirous, talked of his crop and other domestic concerns, and frequently smiled and laughed; his pulse became so irregular that they could not be counted, but must have beat from 130 to 160 in a minute. Strong convulsive fits succeeded each other; he became deaf and blind, foamed at the mouth, gnashed his teeth, and was so restless that it required force to keep him on the bed, until the morning of the 26th, when he expired about eight o'clock.'

THE APPLE AND PEAR.

NATURAL ORDER—*Rosaceae*, resembling the rose in flowers and medicinal properties, being refrigerant, tonic and astringent. CLASS—*Icosandria*, having about twenty stamens situated on the calyx. ORDER—*Pentagynia*, having five pistils. GENUS—*Pyrus*, comprising the apple and pear. Calyx 5-cleft, superior: corol 5-petalled: pome 5-celled, many-seeded; seed compressed, ovate.

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THE APPLE.—*Pyrus malus.*

'The fragrant stores, the wide projected heaps
Of apples which the lusty-handed year
Innumerous o'er the blushing orchard shakes;
A various spirit, fresh, delicious, keen,
Dwells in their gelid pores; and active points
The piercing cider for the thirsty tongue.'

—

THE apple is distinguished as the fruit of the colder climates. It is at once the most brisk and refreshing of any of the common hardy orchard fruits. It remains the longest in season, is used in the greatest number of ways, and, therefore, is the most generally cultivated.

That the apple tree is a native of the eastern part of the world, we have the authority of the earliest writers, both in the sacred history, as well as by the information given by the naturalists of ancient Greece and Rome. The prophet Joel, where he declares the destruction of the fruits of the earth by a long drought, mentions the fruits which were held in high estimation, and among them he names the apple.

'The Greeks call them *Medica*,' says Pliny, 'after the country from whence they were first brought in old times.' Others were called *Epirotica*, from Epirus, their native country; and that these were the same species of fruit that we call apples at this time, there can be no doubt; as they are described in Pliny's Natural History as a fruit that has a tender skin to be pared off; and he mentions crabs and wildings as being smaller; 'and for their harsh sourness they have,' says he, 'many a foul word and shrewd curse given them.'

Apple trees, from the earliest accounts, seem to have acquired the fostering care of man. Of all the fruit trees in Italy, Pliny says the apple is the tenderest, and least able to bear heat or cold, particularly the early kind that produces the sweet jenneting. For a long time the apple tree was of

the highest value among fruit trees with the Romans; 'there are many apple trees,' says Pliny, 'in the villages near Rome that let for the yearly sum of 2,000 sesterces,' which is equal to about forty-one dollars of our money; 'and some of them,' says this author, 'yielded more profit to the owner than a small farm, and which brought about the invention of grafting. There are apples that have ennobled the countries from whence they came; and many apples have immortalized their first founders and inventors. Our best apples,' continues he, 'will honor their first grafters forever; such as took their names from Matius, Cestius, Manlius and Claudius.' Pliny particularizes the quince apples, that came from a quince grafted upon an apple stock, which he says smelled like the quince, and were called *Appiana*, after Appius, who was of the Claudian house, and who was the first that patronised this grafting. 'Some apples,' says Pliny, 'are so red that they resemble blood, which is caused by their being at first grafted upon a mulberry stock;' but of all the apples he mentioned, he says that one which took its name from Petisius, who reared it in his time, was the most excellent for eating, both on account of its sweetness and agreeable flavor. He mentions twenty-nine kinds of apples as being cultivated in Italy at about the commencement of the Christian era. The grafting of trees was carried to its greatest extent about this time. 'I have seen,' says Pliny, 'near to Thuliæ, in the Tyburtines country, a tree grafted and laden with all manner of fruits, one bough bearing nuts, another berries; here hung grapes, there figs; in one part you might see pears, in another pomegranates; and to conclude, no kind of apple or other fruit, but there it was to be found; but this tree did not live long.' Modern grafters will condemn this account as fabulous or exaggerated; but what reason have we to doubt the authority of a man, whose life was spent to the benefit of mankind, and whose death was caused by his perseverance in the research after truth in the wonderful works of nature?

The wild crab is the only apple indigenous to Great Britain and this country; and it is on this stock that most of our valuable apples have been grafted and raised by the ingenuity of the gardeners, who have, by sowing the seeds and studying the soil, so improved and multipled the variety of this most excellent fruit, that it has now become of great national importance, affording an agreeable and wholsome diet, in a thousand shapes, to all classes of society.

The useful qualities of the apple have extended its cultivation as far as the sixtieth degree of latitude. It has been

observed by a distinguished traveller, that the most common fruit trees, such as apples, pears, cherries, and apricots, grow in the open air, wherever oaks thrive. As we proceed farther north, the apple is scarcely known. The people of Lapland showed Linné what they called an apple tree, which, they said, bore no fruit, because it had been cursed by a beggar-woman, to whom the owner of the tree had refused some of its produce. The naturalist found that it was the common elm, a tree also rare in that severe climate.

The varieties of the apple are so many, and they are so rapidly multiplied, that it would be impossible for us, within our limits, to present an account of all of them. The following catalogue exhibits the names of the most celebrated varieties growing in the Kenrick Nurseries in Newton, Mass. and the time the fruit is eatable :—

Early Harvest, Early Red Jenneting, August ; Porter, Pumpkin Sweeting, Seek-no-further, September ; Grand Sachem, Fall Sopsavine, Red Calville, Williams Favorite Reds, October ; York Russeting, October to December ; Blue Pearmain, Old Pearmain, November to January ; Old Nonsuch, Hubbardston Nonsuch, Ripston Pippin, Rhode Island Greening, November to February ; Newton Pippin Yellow, December to March ; Bororassa, November to January ; Monstrous Bellflower, November ; Orange Apple, Winter Sweet, fine, Baldwin, November to April ; Roxbury Russeting, December to June.

Mr. Knight, of Herefordshire, England, who has for some years past been benefiting his country, by creating, if we may use the expression, a new variety of fruits, by bringing the branches of different trees together when in blossom, which appears to have reached its highest perfection. We proceed to relate the manner in which he has so successfully produced new varieties of apples and other fruits.

'It is necessary,' says he, 'to contrive that the two trees from which you intend to raise the new kind, should blossom at the same time ; therefore if one is an earlier sort than the other, it must be retarded by shading, or brought into a cooler situation, and the latest forwarded by a warm wall or a sunny situation, so as to produce the blossoms at the same period.

'The apple blossom contains about twenty stamens or males, and generally five pistils or females, which form the centre of the cup or cavity of the blossom. The males stand in a circle, just within the bases of the petals, or flower leaves, and are formed of slender threads, each of which terminates in a small yellow ball or anther. As soon as the blossoms are

nearly full grown, they must be carefully opened, and all the stamens or males cut or extracted, so as to not injure the pistils or females which will then appear. The blossoms are then closed again, and suffered to remain till they open spontaneously. From the blossoms of the tree, which it is proposed to make the male parent of the future variety, must be taken a portion of their pollen, when ready to fall from the mature anthers, and deposited upon the pistils of the blossoms, which consequently will afford seed. By shaking the blossoms over a sheet of white paper, you will ascertain when the pollen is ready. It is necessary, in this experiment, to cover the branches on which the prepared blossoms are, with a thin muslin or gauze, so as not to touch the flowers, or keep off the sun or air, but to prevent bees or other insects from inoculating them with the pollen of other flowers, which would make the experiment uncertain; and in order to obtain the fruit, and the seeds of a large size, it is best to leave but few blossoms on the tree, and, at all events, to clear the branches on which the prepared flowers are, from all other blossoms. When the fruit is quite ripe, the pips or seeds should be sown at a proper season, in suitable soil; and in about four or six years fruit may be expected.' Mr. Knight has also made some curious experiments between the peach and the almond, an account of which will hereafter be given in this work.

In pruning apple trees, nothing more should be done than to cut out all those branches which cross each other, to prevent the rubbing of the bark; but never to shorten any of their shoots, except those shoots or suckers which proceed from the stem, which should be entirely taken off, as also all branches broken by the wind or accident, which should be cut off close to the division of the branch. November is the best time to prune apple trees, as it injures them to prune in frosty weather, or when the sap begins to rise. Pruning is to be avoided as much as possible, as it creates useless shoots, and prevents the fruiting; but if trees are becoming too full of branches, the better way is to rub off the buds and shoots, which are irregularly produced in the growing season. All sorts of apple trees produce their fruit upon cursions, or spurs, therefore it is necessary to be careful not to cut off or destroy them, as they continue to be fruitful for several seasons.

Apple wine is admired as a summer beverage, but it is by no means equal to the cider made from the golden pippins, which, when given in good condition, and well timed, surpasses every other refreshing drink. The spirit extracted from cider is equal to brandy for preserving fruit, or preparing domestic wines or liquors.

A solution of iron in the juice of the golden rennett, evaporated to a thick consistency, proves an excellent chalybeate.

Dr. Short informs us that cider was first invented by a Norman, who much admired the delicate flavor of apples; and 'long observation,' says he, 'assures us that such as chiefly drink cider, are more healthy and strong, and have better complexions than those that are accustomed to wine and ale.' Both Lord Bacon and Dr. Baynard tell us of several persons near a hundred years of age, and some above, who, having seldom any other liquor, were very active and vigorous at that age. It is certainly more nourishing than wine, for not being so thoroughly fermented, its spirits are less subtile and impetuous.

'There is made an ointment,' says Gerard, 'with the pulp of apples and swines' grease, and rose water, which is used to beautify the face, and to take away the roughness of the skin, which is called in shops *pomatum*, of the apples whereof it is made.'

The apples intended to be preserved for the winter should remain on the trees until quite ripe, which will take place at the coming of the first heavy frost, when they should be gathered in dry weather, and placed in a heap for five or six weeks, in order to sweat: they should then be carefully wiped dry, and those that are perfectly sound, packed in large jars or boxes so as to be excluded from the air, which will keep them sound and plump, and retain their flavor; or they may be packed down in oat chaff or plaster of paris.

The various diseases to which the apple tree is subject, have occupied the attention of the greatest naturalists, as well as many of the most eminent practical gardeners. Animals of different species are found to engender a variety of kinds of animalculæ, particularly where cleanliness is not attended to. Trees, according to their kind, attract different blights: our endeavors, therefore, would be in vain to avoid the blight affecting the leaves and blossoms of large trees; but as the trunk and branches of the apple tree are often injured, and sometimes destroyed by animalculæ, an attention to the cleanliness of these trees cannot fail of being beneficial to their growth.

If the apple trees be rubbed with the leaves and young shoots of the elder, to which all kinds of blight have an antipathy, these injurious, though minute insects, will not only be destroyed, but it will prevent their fixing themselves on these trees.

A great enemy to apple trees in many parts of the country, is the caterpillar. The surest method of destroying them, is

to go early in the morning and twist their nests out of the trees with a forked stick or long pole. It is said that by placing a large clod of dirt in the fork of an apple tree, or by tying dirt or salt around the body of the tree, that all the caterpillars will immediately desert, and will not crawl over the dirt again to get into the tree. But they are so easily destroyed by the former method, that it should be considered nothing but indolence in any one who permits his orchards to be injured by these insects.

Apple trees are very often almost entirely ruined by moss, which kills many, and injures others so much, that they are only an incumbrance to the ground, and a disgrace to the country. This evil may easily be checked, by scraping and rubbing off the moss in the spring of the year, with some suitable instrument. Draining the land, if too wet, or retentive of moisture, will sometimes prevent or cure moss; or digging round the trees on the approach of winter, or in the spring, and bringing fresh mould, or the scouring of ponds, or the earth ploughed up on the site of long-standing fences, and laid round them. In short, whatever contributes to the health of the tree, will cure or in some degree mitigate this and other diseases.

The Pear.—*Pyrus communis.*

'The juicy pear
Lies in a soft profusion scattered round.
A various sweetness swells the gentle race,
By nature's all-refining hand prepared,
Of tempered sun and water, earth and air,
In ever-changing composition mixed.'

The accounts we have of this fruit are of great antiquity, as the pear tree was consecrated to Minerva previous to the olive.

The earliest writers mention it as a fruit growing abundantly in Syria and Egypt, as well as in Greece; and it appears to have been brought into Italy from these places about the time that Sylla made himself master of the latter country, although there is no doubt but the Romans had several kinds of this fruit before that time. Virgil speaks of pears which he had from Cato; and Columella mentions a considerable variety of pears. Pliny writes of them as being then exceedingly numerous in Italy, and says that a fermented liquor was formed of their expressed juice. It is probable that the Romans brought the cultivated pear into England, but at what

period we have no account; we may surmise, however, that they did not neglect the propagation of this fruit when they were masters of Great Britain. The pear is mentioned by all the early writers of that country.

'Both pears and apples,' says Pliny, 'have the properties of wine, on which account the physicians are careful how they give them to their patients; but when sodden in wine and water, they are esteemed wholesome.' Again he states—'All pears whatsoever are but a heavy meat, even to those in good health, and the sick are debarred from eating them; and yet, if they are well boiled or baked, they are exceedingly pleasant and moderately wholesome; when sodden or baked with honey they agree with the stomach.'

Some pears were used as a counterpoise against the venomous mushrooms; the ashes of the pear tree wood are also used for the same medicinal purpose; and perry is considered the best liquor that can be drunk after a surfeit of mushrooms.

In general pears are windy, and improper for weak stomachs; those are best that are quite ripe and have a sweet juice, and then they are seldom noxious unless eaten to excess.

The timber of the pear tree is of a yellowish color, and is used for making carpenters' tools, measuring rulers, picture frames and a variety of purposes. Gerard says—'The timber of the wild pear is very firm and solid, and good to be cut into moulds.' The plates of his book were cut out of this wood, as were, says he, 'breast-plates for English gentlewomen.'

The varieties of the pear, like the apple, are so numerous that we are unable to give an account of all of them. The following catalogue, however, contains the names of the most celebrated varieties growing in the Kenrick Nurseries, and the time the fruit is eatable:—

Citron des Carmes, Early Green Chissel, or Early Chaumontelle, Early Catharine or Rousselet Hatif, Fine Early, Jargonelle, August; Bartlett, new—supposed synonymous with Williams' Bon Chretien, Late Green Catherine, Mogul Summer, or Chelmsford, Preble's Bergamotte, Windsor, September; Andrews, Amory or Gibson, Harvard, formerly called L'Epergne, Brocar's Bergamotte, Seckle, October; St. Michael, October to November; Monsieur Jean, November; Prince's St. Germain, November to February; Large Yellow Winter; Spanish Bon Chretien, November to January; Pound, November to April; Bezy de Chaumontelle, or Winter Beurre, November to February; Colmar, or Poire manna, December to March; St. Germain, or Inconnue Lafare, November to April; Vir-

gouleuse, or Poire de Glace, November to January; Belle de Bruxelles, August; Bergamotte des Paysans, September; Bergamotte de la Pentecote, winter; Beurre d'Aremburg, November to January; Beurre Capiaumont, September to October; Beurre Knox, November; Beurre Napoleon, October to November; Beurre Rance, or Hardenpont, des printemps, winter; Bon Cretien Williams, September; Delices d'Hardenpont, January; Forelle, October; Gloria, formerly Colmar d'Hiver, Lowell, winter; Marie Louise, November; Passe Colmar, Sylvanche Verte d'Hiver, winter; Urbaniste, October.

The pear tree is liable to be much injured if pruned by those who do not understand the nature of it. The blossoms are commonly produced from buds at the extremity of the last year's shoots, and as these are often cut off by the unskilful pruner, it prevents their producing fruit, and causes the boughs to send out new branches, which overfill the tree with wood. The summer is the best time to look over the pear trees, and to remove all superfluous and foreright shoots which would too much shade the fruit. If this be carefully done they will require but little pruning in the autumn.

Pears that are to be kept for the winter use should hang as long on the trees as the state of the weather will allow. They should then be put in a heap, in an open and dry situation, for about ten days, then wiped with a dry woollen cloth, and packed close from the air and moisture. But to keep this fruit in its greatest perfection, small earthern jars should be selected, about the size of the pear, which should be packed separately in clean oat chaff, and tied down with skin or brown paper cemented with pitch. These jars should then be packed in a chest or dry closet, with the bottom upwards.

Pears are found more generally productive when grafted on quince stocks than upon those of their own kind or upon the white thorn.

COPPER.

CLASS—*Metallic*, comprising metals. GENUS—*Cupreum*, comprising copper.

COPPER ranks next to iron in utility; and though less abundant, occurs in regions of the globe. It is often found in pure metallic masses, sometimes very large. It is also common in the state of a sulphuret and a carbonate. It is chiefly manu-

factured from the copper pyrites, found in primitive rocks. But it is found in all the geological classes of rocks.

England has the most extensive mines of copper, particularly in Cornwall; and produces somewhat more than all the rest of Europe.

Considerable mines are also wrought in the middle and north of Europe—among the Ural Mountains—and in Siberia. Greenland, Iceland, Tartary and Japan, also furnish copper; as well as Barbary, Southern Africa, and the southern part of South America.

Copper ore is found in many parts of the U. States. That of Belville, near Newark, N. J. was formerly very productive.

A strip of land, in the Huron country, twenty miles by four or five miles, in which Mineral Point is situated, is filled with a sulphuret of copper, one hundred and seventy tons of which had been dug, on the first of September last. Not having been smelted, its value is not yet tested, though its appearance indicates a rich copper ore.

Besides these mines, the only broken and sterile part of this Territory, adjoining Lake Superior, is known to possess copper mines. A great mass of pure native copper, it is said, lies in the bed of the river Ontonagon, which empties into Lake Superior on the south, which exceeds a ton in weight.

Copper is a brilliant metal, of a red color, very hard, sonorous and elastic; and the most ductile of all the metals, except gold. Its malleability is also so great, that it is hammered into leaves, and sold in thin paper books, in imitation of leaf gold. It will not burn so easily as iron, which is evident from its not striking fire by collision. On this and other accounts it has been substituted for iron, in the machinery which is employed in gunpowder mills. It becomes fusible in a temperature of 2205° F. above zero, and is 5.91 times heavier than water.

The uses of this metal are too various to be enumerated. Besides its employment to make boilers and other vessels of capacity, and to sheathe the bottom of ships, it enters as a component part of several of the most important alloys. The most important of these alloys is brass, which is formed by alloying twelve to eighteen per cent. of zinc with copper. When the proportion of copper is larger it forms *pinchbeck.* Six parts of copper, two of tin, and one of arsenic, form *speculem metal.* Three parts of copper, with one of tin, form *bell metal;* and for small shrill bells a small quantity of zinc is added. Copper and tin form *bronze* and *gun metal,* which is composed of ten parts of copper to one of tin.

Copper long exposed to moisture in a damp place, becomes a green carbonate at the surface.

ILLUSTRATION. Scrape off the green crust from a piece of copper and pour muriatic acid upon it, and it will effervesce, by the escape of carbonic acid. Pure copper will not effervesce, which may be shown also.

APPLICATION. All copper and brass utensils should be defended from moisture by tinning or by carefully cleaning; for the carbonate of copper is very injurious if taken into the stomach.

Copper combines with sulphuric acid and forms sulphate of copper, called blue vitriol or Roman vitriol.

ILLUSTRATION. Boil copper filings in sulphuric acid, and the salt will be formed in the liquid state. This may be evaporated in the usual way.

APPLICATION. On this principle the blue vitriol of the shops is made; but not by a similar operation. The native sulphuret is heated and exposed to air and moisture, and thereby the peroxid is obtained. Then the salt is readily formed by pouring sulphuric acid upon it.

Vinegar will both oxidate copper and form with it the salt called verdigris, or acetate of copper.

ILLUSTRATION. Cover a gallipot of warm vinegar with a polished piece of sheet copper. After some time it will be covered with a thin crust of verdigris. It is best for standing several hours after cooling.

APPLICATION. Upon this principle, though with very different apparatus, the verdigris of the shops is made. This is used in coloring glass, which gives it a beautiful green tint.

Copper has a strong affinity for ammonia, with which it will combine when in the state of salts or otherwise, and form various colored compounds.

ILLUSTRATION. Rub together in a mortar about equal bulks of sulphate of copper and carbonate of ammonia. A purple compound will be formed.

APPLICATION. This is the ammoniuret of copper used in medicine.